Enhancing Mission Success in the 21st Century Through Collaborations

The 2003-2004 NASA Leadership Development Program (LDP) Class

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Our Vision

- To team effectively *across and within* disciplines, Enterprises, Centers, and Headquarters at all levels.

- To have resources available to stimulate and support effective collaboration.

- To have the tools and systems in place to make it easy to collaborate.

- To leverage talent and expertise effectively.

- To have a culture that encourages open, honest communication and information sharing.

- To build trust and a spirit of unity in the way we work.

- To collaborate effectively with external partners.

Collaboration is when two or more participants work together on an effort of mutual interest.

Characteristics of good collaborations:

- The participants define and operate to a common set of goals.
- The participants define, develop, and operate to a common set of requirements.
- The participants have clearly defined and understood roles and responsibilities.
- The participants agree what are acceptable deliverables or results.
- The participants agree on the process to produce the agreed upon deliverables or results.
- The participants agree on their respective contributions toward the deliverables or results.
- The participants agree how the results of their collaboration are delivered and shared.
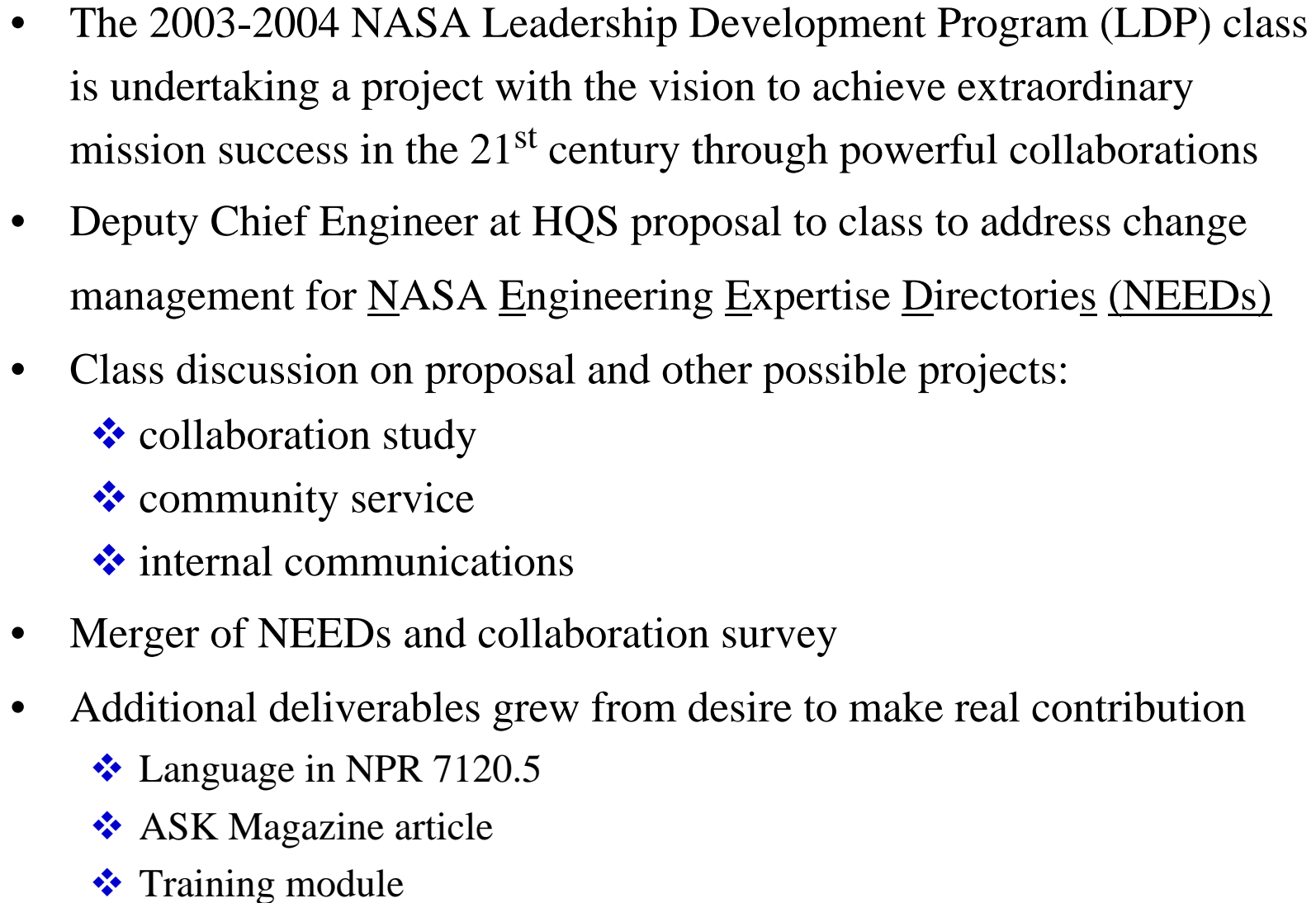
The 2003-2004 Leadership Development Program

- Component of NASA's integrated Human Capital Strategic Plan
- Develops effective leaders who align with NASA's mission and vision of the future and creating measurable results
- Prepares leaders to take on more significant and broader roles and responsibilities in the near future
- Immediate practical application of the leadership theory and skills being learned in order to achieve Agency goals and produce real, measurable results
- Leadership experience that requires participants to collaborate in cross-Agency teams, test and stretch their leadership

- Training –
  - ❖ Six leadership training workshops
  - ❖ One developmental assignment outside home center
  - ❖ One collateral assignment outside of developmental assignment
  - ❖ Other training, mentoring, shadowing, and developmental opportunities
- 20 NASA employees from 9 Centers
- **Agency wide results project**

Enhancing Mission Success in the 21st Century Through Collaborations

- The 2003-2004 NASA Leadership Development Program (LDP) class is undertaking a project with the vision to achieve extraordinary mission success in the 21st century through powerful collaborations

- Deputy Chief Engineer at HQS proposal to class to address change management for <u>N</u>ASA <u>E</u>ngineering <u>E</u>xpertise <u>D</u>irectorie<u>s</u> <u>(NEEDs)</u>

- Class discussion on proposal and other possible projects:
  - ❖ collaboration study
  - ❖ community service
  - ❖ internal communications

- Merger of NEEDs and collaboration survey

- Additional deliverables grew from desire to make real contribution
  - ❖ Language in NPR 7120.5
  - ❖ ASK Magazine article
  - ❖ Training module

Goals for NASA Collaboration

- Goal #1: Catalog collaboration principles and best practices

    - Set of synthesized collaboration principles and best practices (with examples) based on internal and external benchmarking of collaboration successes and failures.

- Goal #2: Infuse collaboration best practices into new and existing tools and programs

    - Systemic assessment of "leverage points" and recommendations with respect to tools that facilitate effective collaboration.
    - Embed collaboration principles and best practices into program and project management.
    - Implementation plan for specific projects regarding how to incorporate collaboration principles and best practices and how to monitor follow-up.

- Goal #3: Align incentives and structures to support effective collaboration

    - Systemic assessment of "leverage points" and recommendations with respect to incentives and structures to support effective collaboration.
    - Implement plan for one change initiative based on assessment.

Neither rain, nor snow, nor gloom of night…
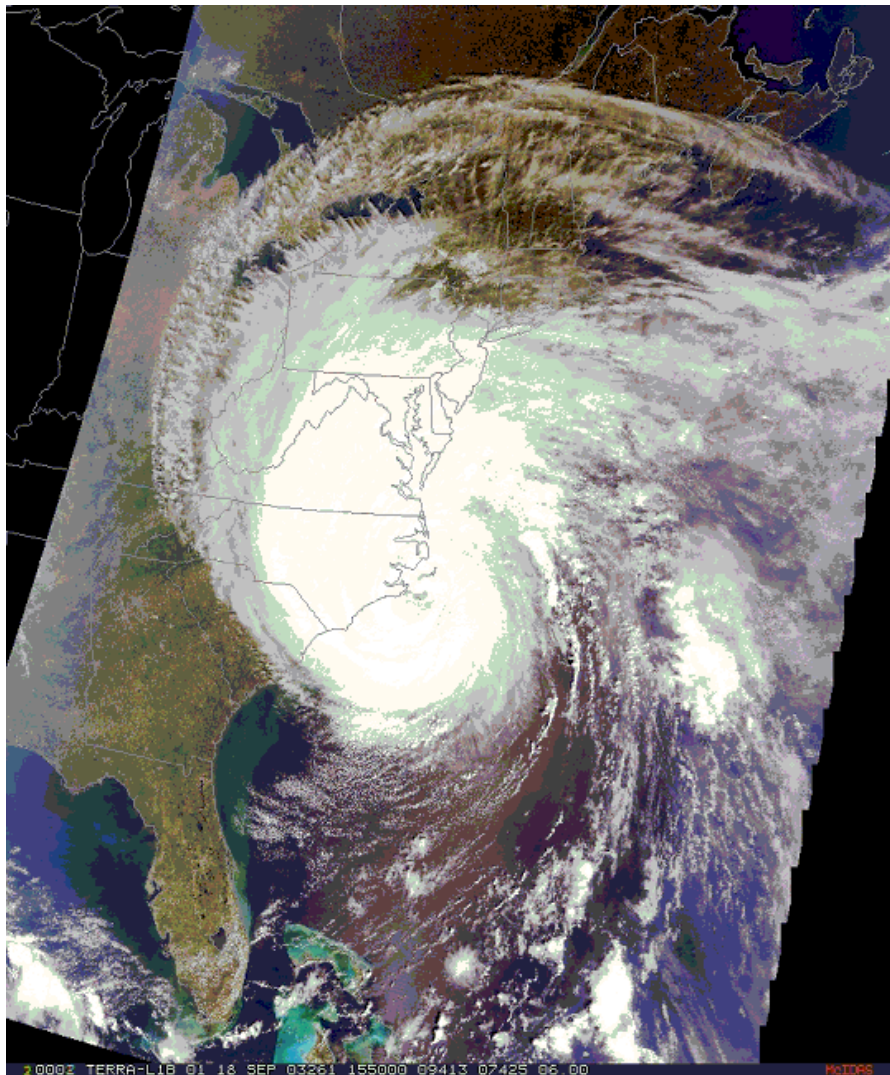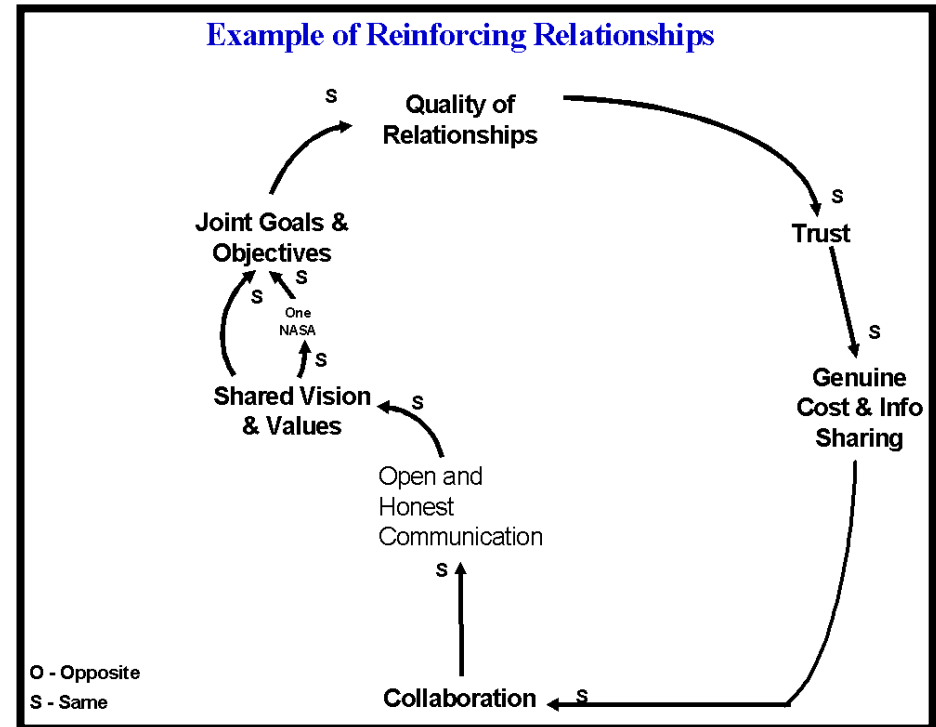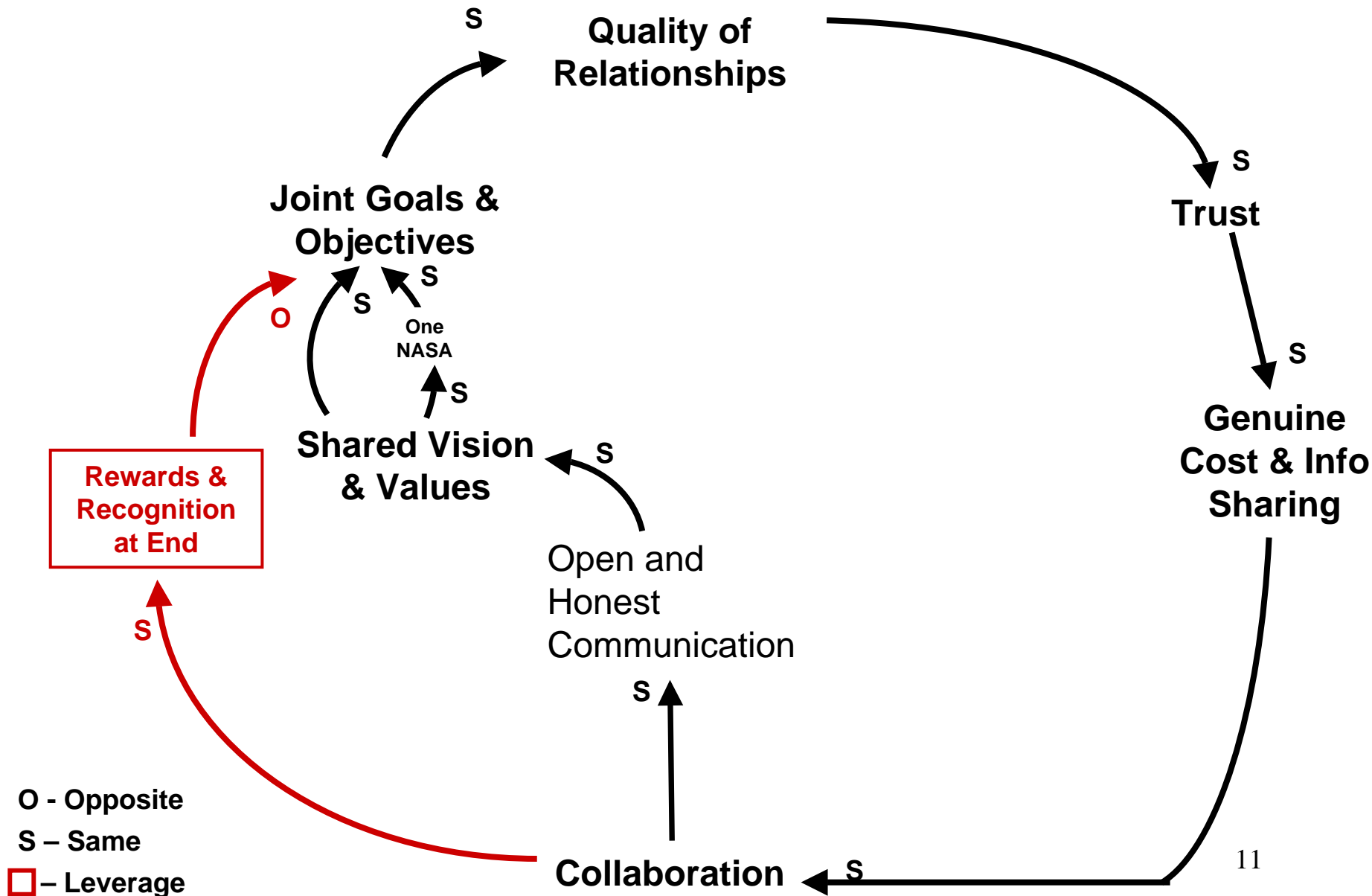
- Defined collaboration
- Preliminary survey questions developed
- Test surveys administered
- Systemic analysis
- Literature review
- Survey topics defined
- External benchmark
- Topics and example questions provided to consultant
- Consultant developed questionnaire and survey
- Class review/addition of Executive Survey
- Interviewer training
- Brainstorm list of projects to survey
- Down select/within NASA, two or more centers
- Administer survey
- Results analysis by consultant
- Synthesis of best practices

- Captures the conversations in the interviews-tells a story.

- Identify trends and common themes (survey data).

- Identify what is getting in the way of collaboration.

- Identifies where to find the greatest leverage for sustained change (reinforcing and opposing forces).

  - ❖ Enablers
  - ❖ Inhibitors

- Identify actions that will modify behaviors and the espoused mental models versus those in actual use.

Example of Reinforcing Relationships

Quality of Relationships

Joint Goals & Objectives

Trust

One NASA

Shared Vision & Values

Genuine Cost & Info Sharing

Open and Honest Communication

O - Opposite
S - Same

Collaboration

Quality of Relationships

S

Trust

Joint Goals & Objectives

S **S** **S**

One NASA

O

S

Genuine Cost & Info Sharing

Rewards & Recognition at End

Shared Vision & Values

S

Open and Honest Communication

S

S

S

O - Opposite

S – Same

☐ – Leverage

Collaboration

S

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Leverage Point Example 1:
Reward and Recognition at end of Collaboration

❖ With increases in collaboration efforts, the method of reward and recognition becomes more and more visible.

❖ At present, NASA rewards results as measured at the end of a program. We say we want our people to behave collaboratively, yet rewards are strictly on results and not behavior.

❖ This mixed message of what we say we want and what we reward results in agendas that inhibit true collaboration.

Recognition across collaborating teams is inconsistent, and the recognition is appreciated more (less) when it occurs well before (after) the project has ended. It is not unusual for some people to move on during a long-lived project.

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Leverage Point Example 2:

Staff Turnover

❖ Turnover at NASA takes place without apparent regard for the effect on collaborative teams.

❖ When priorities change people may be transferred to another program as if all engineers and scientists are fungible.

❖ Since relationships and trust are the cornerstones of collaborative ventures, the effect of replacing an individual can negatively impact program progress. In addition, much of the work is done through an informal and largely unseen social network.

❖ Replacing a node in this network can be crippling.

Consideration of both the technical and interpersonal skills of people and the needs of the team, as well as allowing time for transitions, often is not included in NASA turnovers.

- Quarterly recognition program aimed at highlighting exceptional cross-functional teamwork-collaboration across organizational boundaries

- Winners are recognized on Corporate intranet Web site and company meetings (Goals: exposure and best practice sharing)

- Team of the Year

- Award donated to charity

- Daily communication with franchises

- International partner who understands regional culture

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Cisco Intranet (CEC)
Tues 23rd June

The class brainstormed a list of potential topics:

- Lack of face to face interaction, collocation of participants
- Funding distribution
- Planning did not involve all parties
- Parochialism
- How do you communicate
  - Tools for meetings
  - Virtual teaming
  - Virtual teaming possibilities
- What is recognized and recorded, formal or informal agreements
- Role of position. What is project role of respondent: Program manager, Project Manager, Science, Systems Engineering, Finance, etc.
- Level of management commitment
- Final goal alignment
- Team make-up
- Team identity (is there one?)
- Metrics used to measure collaboration
- Staff turnover

- Schedule pressures inhibit relationships
- Unclear partner responsibilities
- Competition: At planning stage. During project? Good or bad?
- Celebrating successes
- Administrative controls: performance plans, incentives
- Establishing Trust
- Willingness to share knowledge
- Allocation of accountability
- Characteristics of team leaders: personality issues
- Funding inadequacies
- Lack of understanding of each others culture
- Access to expertise
- Control of people: matrixed personnel, ability to focus on project, project manager inputs to performance appraisal, lines of authority clearly defined?

In addition to the brainstorming list and the preliminary survey, the following list of themes we wished to address was developed and provided to a consultant in Social Psychology with expertise in developing and administering surveys.

- Project success
- Communications
- Funding
- Planning
- Project success
- Schedule

- Turf
- Culture
- Co-location
- Responsibilities
- Personality
- Team identity
- Staff turnover

The consultant, based on the information we provided and her expertise, suggested a two part format consisting of a multiple choice questionnaire and an open-ended interview survey.

The questionnaire was to be sent to the interviewees ahead of time and self administered, the surveys were conducted by class members either in person or over the telephone.

This format would provide both numerical data that could be statistically analyzed and an opportunity to capture individual comments.

The class reviewed the questionnaires and surveys developed by the consultant.

Based on our systemic analysis, the class decided that the consultant should develop an additional survey for interviewing executive management.

We attempted to interview as many Center Directors and Associate Administrators as possible.

The consultant provided interview training to all class members.

A confidentiality statement was developed and all interviewers read it verbatim.

All personal identifying information was removed from the data by the analyst so that none of the answers given would be traceable to any individual being surveyed.

Original interview data was destroyed.

The class brainstormed a list of potential projects to survey based on individual's familiarity and potential accessibility.

- GSFC/GMIS
- X-38 CRV (JSC-DRFC-Sandia)
- X-37 (MSFC-DFRC)
- X-43/HyperX(LaRC-DFRC-OSC-Micro Craft)
- Habitat Holding Racks (ARC-MSFC)
- Light Microscopy Module (ARC-GRC)
- Free Flyer Initiative (ARC-GSFC)
- ISS Small Payloads (ARC-KSC)
- Kepler (ARC-JPL)
- OSP
- NGLT
- AEE
- ISAT/AEE
- SATS
- CALIPSO
- GIFTS
- Aries
- Tropical Rainfall Measuring Mission (GSFC-MSFC-LaRC)
- Altus Cumulus Electrification Study (MSFC-GSFC)
- Burst and Transient Source Experiment on Gamma Ray Observatory (GSFC-MSFC)
- Aquarius (GSFC-JPL)
- JIMO

- NPOESS Preparatory Project (HQS-GSFC-NOAA-DOD)
- Revolutionary Aerospace Systems Concepts (LaRC-MSFC-GRC,…)
- Space Architect Team
- Aeroassist Working Group
- Communications Architecture Working Group
- Hubble Space Telescope Project
- University of Texas Medical Branch for the Graduate Program in Space Life Sciences
- Advanced Human Support Technologies (JSC-ARC)
- Artificial Gravity Project (NASA-Russia-Germany[DLR])
- Consolidated Space Operations Contract
- Code G Committee for Rvw of Ethics Policy & Guidance
- SATS
- ARES
- HSR
- National Institute of Aerospace
- Fire Support Agreement btwn Hampton and LaRC
- Airport Expansion - South 40 Asset Relocation
- ISTAR (MSFC, LaRC, GRC, DFRC, Boeing, P&W , Aerojet)
- Critical Hybrid Pulse Detonation Engine Test (GRC, AFRL, Boeing)
- GTX (GRC, LaRC, GASL)

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The list was down selected to include only the top 1-2 priority collaborations nominated by each class member, which resulted in 16 projects whose "business as usual" costs ranged from $600K to $2B.

❖ The consultant suggested that we select three individuals from each side of a collaboration (upper management, middle management, and line worker).

❖ Since we had selected 16 collaborations to examine, that resulted in a total of 96 interviews to be conducted. The consultant determined that these numbers would yield statistically meaningful results.

❖ The class administered the surveys over a three week period.

❖ Questionnaires were distributed electronically and interviews scheduled.

❖ Interviews were conducted by a team of two people: one conducting the interview and taking notes, the second only taking notes.

❖ All data were provided to the consultant for analysis.

❖ Interviewers transcribed written notes into Excel spreadsheets which were E-mailed to the consultant.

❖ All original hand written notes were also mailed to the consultant.

❖ Questionnaires were also provided to the consultant either as hard copy or electronically depending on how the responder provided their responses.

❖ The consultant then tallied all survey responses and looked for the larger trends based on demographic data.

❖ The numerical data from the questionnaires were statistically analyzed to:

- Establish the level of correlation between success and the answers to the various questions
- Look at average scores to determine how entire group responded
- Determine if there were statistically significant differences based on demographic information.

Enablers

- Confidence
- Respect of NASA Peers
- Trust
- Resources (of skills) increased (lack now)
- Common interest
- Relationship Building
- ONE NASA
- Clear need
- Mutual exchange, benefit - balance
- Sharing of resources
- Timing is right
- Reward high level people during process
- Be able to keep money saved
- Collaboration as a requirement?
- Appreciate cultural differences (priorities, interests, way of doing things, timelines, etc.)
- High commitment
- All parties involved
- Strategic vision understood at all levels
- Expectations of all parties the same
- Quality of people

Inhibitors

- Time consuming
- Lack or reward and recognition
- Lack of structure for collaboration
- Senior people have to give up something
- Risk to career and reputation
- Loss of autonomy and power
- Risk to Agency (legal/OMB)
- Not-Invented-Here
- Non-conformity with Center rules = threat
- Potential Congressional/Hill Involvement
- Hierarchical mentality (someone has to own & be in charge)
- Unwillingness to share with competitors
- Process to designate partners is broken
- Lack of people mobility (including Center resistance)
- Goals and roles unclear
- Difficulty in face-to-face time
- Command and control culture
- Unequal roles

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❖ Modifications of criteria used in the NON-SES Performance Element #5: Teamwork and Collaboration (the Agency uses these in FY05),

❖ Revise the criteria for some subset of the Group Achievement Awards, possibly including in NASA Awards Policy a provision that discusses the characteristics of collaboration in group award situations and the need for review, evaluation, and feedback on the collaborative effort at various stages of a project or activity not just at the end,

❖ Addressing the impact on the collaborative effort when team members are reassigned out of the project/activity, and

❖ Address shortfalls in training for collaboration

Summary

❖ Formed an inter-agency team to improve collaboration in NASA

❖ Conducted surveys and interviews of inter-center projects to identify enablers and inhibitors to collaboration

❖ Conducted surveys and interviews with Senior Executives to get insight into the view from the balcony vs the playing field

❖ Synthesized systemic analysis, survey results, and interviews to develop recommendations and an implementation plan to improve collaboration in NASA

❖ Dialogue with stakeholders is underway- Code S, D, F, One NASA

❖ Final report-out June-July 2004